AWIPS Evolution

Preliminary IV&V Report for Task Order 8

National Weather Service

March, 2008

Revision History

Rev. No.	Date	By	Description of Changes
0.1	3/17/08	Cliff Wong	Initial Draft
0.2	3/21/08	Cliff Wong	Incorporate comments from IV&V team members
0.3	3/26/08	Cliff Wong	Updated MDL's test results

1 General Information

1.1 Purpose:

The purpose of this document is to report the findings for the Independent Validation and Verification (IV&V) of Task Order 8 software delivery for the Advanced Weather Information Processing System (AWIPS) by Raytheon.

1.2 Overview

The IV&V is considered to be a life cycle process based on the principle that detecting problems early in the project will cost less than if they are detected later. Early detection allows more time for correction and allows more degrees of freedom for corrective actions. A successful IV&V wherein the findings support accuracy may promote confidence in the program without having to rigorously test it before further investment.

For TO-8, the AWIPS ADE extends the ADE capabilities delivered under TO-6 AWIPS Continuous Technology Refresh (CTR) Re-Architecture initiative. The capabilities of TO8 provide additional migrated end-user applications.

This report presents the findings of our assessment review.

2 Reference Documents

- *AWIPS Software Product Improvement Plan*
- Internal Software Test Plan by Raytheon

3 Verification Goals

This IV&V has the following goals;
- verify TO8 CAVE functionality
- verify TO8 ESB functionality
- verify TO8 functionality as development platform
- verify TO8 on Red Hat Enterprise Linux
- verify TO8 on Microsoft Windows XP Pro SP2

For the purposes of this IV&V 'verify' means the functionality works as intended as advertised, i.e., 'it works'.

4 Methodology

Verifying the basic functionalities of TO8 required a simple, yet sound, methodology. One goal was always in mind, and that was the methodology must be designed such that anyone could replicate it and achieve similar results.

The team performed the NWS defined tests in addition to selected planned tests performed at the Raytheon Omaha test facility.

4.1 Definition / Criteria

A test is considered “passed” if any of the following is true:

- There is no unexpected error found.
- It is obvious to the tester that test case documentation is incorrect (e.g. typo or missing steps) and tester is able to make correction and continue the rest of the test. In this case, an anomaly report should be written on the documentation error.
- Work around is found to proceed with the test case. An anomaly report will be written for it.

A test is marked "incomplete" if

- A feature is not implemented in TO-8 in order to carry out the planed test. The test will be deferred until the required feature is available.
- Data/product is not available that inhibit the ability to run the test.

A test case is marked "failed" if any of the following is true:

- A major functionality contained in the test failed.
- Defect prevents tester to fully execute test procedure (e.g. blocking several steps in it).
- Test failed most of the time.

5 Test Result

A total of 6 test platforms were used to support the testing of the ADE. A description of the configuration for each of the test platforms can be found in Appendix A. While each of the anomalies will be forward to RTS separately, the results of executing all the RTS test cases are summarized in Table 1 below:

Test Cases	Test Bed 1 (GSD)	Test Bed 2 (MDL)	Test Bed 3 (NCEP)	Test Bed 2 (OHD)	Test Bed 4, 5 (SEC-Linux)	Test Bed 6 (SEC-Windows)
3_5_Panel_Display_1.0	Failed[1]	Passed[1]	Passed	Passed	Passed	Passed
ColorMap_Editor_1.0	Passed	Passed	Passed	Passed	Passed	Passed
Database_1.0	Passed	Passed	Passed	Passed	Passed	Passed

[1] Trouble ticket(s) (TTR) is/are being created for the test cases.

Map_Service_1.0	Passed	Passed	Passed	Passed	Passed	Passed
Meteogram_1.0	Failed	Passed	Passed	Passed	Passed	Passed
Plot_Model_Maintenance_1.0	Failed	Passed	Passed	Passed	Passed	Passed
Radar_Display_1.0	Passed	Passed[1]	Passed	Passed	Passed	Passed
Screen_Capture_1.0	Passed	Passed	Passed	Passed	Passed	Passed
Skew_T_1.0	Passed	Incomplete[2]	Failed[1]	Passed	Passed	Passed
SOA_PlugIns_1.0	Passed	Passed[1]	Failed[1]	Passed	Passed	Passed
Text_Display_Edit_1.0	Passed	Incomplete[2]	Incomplete[2]	Incomplete[2]	Passed	Passed
Vectors_1.0	Passed	Passed	Passed	Passed	Passed	Passed
Volume_Browser_1.0	Passed	Passed	Passed	Passed	Passed	Passed
WarnGen_1.0	Passed	Passed	Passed	Passed	Passed	Passed
Workstation_CAVE_1.0	Passed	Passed[1]	Passed	Passed	Passed	Passed
Workstation_Bundles_History_1.0	Passed	Passed	Failed[1]	Passed	Passed	Passed
Workstation_Localization_1.0	Passed	Passed	Passed	Incomplete	Passed	Passed
Workstation_Modes_1.0	Passed	Passed	Passed	Passed	Passed	Passed

Table 1 Summary of test results

6 Conclusion

We welcome the many new features introduced in TO8. For most of us who had tested ADE 1.0, we did not experience problem during installation and were able to start testing soon after the delivery. However, we are not impressed with the performance running EDEX / CAVE on current AWIPS baseline systems. We also saw a recurring problem with the database catalog and HDF5 metadata repository getting out of sync.

However, because the EDEX server-side would not run optimally in a cluster on the AWIPS baseline DX server hardware, we were forced to run EDEX on a standalone server. Also, the out-of-the-box installation of CAVE does not support a multi-user environment (i.e. it assumes a single CAVE user). We were disappointed that we did not receive a more enterprise-ready installation.

Documents still lack detailed information in our view. Team members who are new to AWIPS 2 found the two installation procedures included on DVD inadequate to perform the proper installation. Test case documents also suffer from the following:

- Lack of minimum hardware requirement
- Neglect to mention that the hdf5 folder needs to be NFS mounted
- Missing database connection information (user name/password) using tool such as PgAdmin
- Assume that some weather elements (e.g. Radar/reflectivity) are available during test

[2] Test is incomplete due to lack of data to continue the test.

We recommend RTS to review all test cases to ensure their completeness and correctness, perhaps adding hardware configuration diagram for better illustration.

Appendix A: Test Beds

1 Test Bed 1

The following hardware/software items are configured as the test computer at GSD test facility:

- Computer : Dell Optiplex Gx270t
- Processor: Intel Pentium 4, 3.2 GHz
- Memory: 2GB RAM
- Hard Drive: Seagate Barracuda 120 Gigabyte SATA
- Graphics Card: Nvidia Geforce Fx 5200 128mb AGP 8x VGA/Dvi
- Monitor: Dell Ultrasharp 19” LCD
- Red Hat Enterprise Linux (RHEL) 4 u4

2 Test Bed 2

The following hardware / software items are configured as the test computer at NWS HQ test lab:
•NHDA – baseline AWIPS PC

- Computer: Dell PowerEdge 2850
- Processors: dual Intel Xeon 3.2GHz
- Memory: 4 Gigabyte RAM
- Hard Drive: 72 Gigabyte SCSI
- Video Card: G Force 7600 GT with 256 MB Video RAM
- Monitor: Three 19” LCD Monitors
- Red Hat Enterprise Linux (RHEL) 4 u2

3 Test Bed 3

The following hardware / software items are configured as the test computer at NCEP test facility:
•Linux PC 1

- Computer: IBM Intellistation Z Pro
- Processors: Intel(R) Xeon(TM) CPU 2.40GHz
- Memory: 2 Gigabyte RAM
- Hard Drive: 36 Gigabyte SCSI
- Video Card: NVIDIA GeForce 7600 GT with 256 Megabytes RAM
- Monitor: One 19” LCD Monitor
- Red Hat Enterprise Linux (RHEL) 4 u5
- JAVA 1.6 update 1

4 Test Bed 4

The following baseline AWIPS hardware / software items are configured as the test computer at NWS HQ test lab:

•NAPO - baseline AWIPS PC

- Computer: HP Workstation XW 6200
- Processors: Dual Intel Xeon 2.8GHz
- Memory: 2 Gigabyte RAM
- Hard Drive: 32 Gigabyte SCSI
- Video Card:
  G Force 7600 GT with 256 MB Video RAM - - drives left and middle monitors
  NVIDIA 285 graphics with 128 MB video RAM - drives right monitor
- Monitor: Three 19” LCD Monitors
- Red Hat Enterprise Linux (RHEL) 4 u2
- JAVA 1.6 update 1

5 Test Bed 5

The following non-baseline AWIPS hardware / software items are configured as the test computer at NWS HQ:

•Linux PC1– Stand alone, non-baseline AWIPS PC

- Computer: Dell Dimension
- Processors: Dual Xeon, 1400 MHz CPU's
- Memory:1 Gigabyte RAM
- Video Card: NVIDA GeForce FX5500, 256 MB Video RAM
- Red Hat Enterprise Linux (RHEL) 4 u2
- JAVA 1.6 update 1

•Linux PC2– Stand alone, non-baseline AWIPS PC

- Processors: AMD Dual Core 3800+ (2GHz clock) CPU with 512Kb cache
- Memory:1 Gigabyte RAM
- Video Card: NVIDA GeForce 7600 GT, 256 MB Video RAM
- Debian Sid Linux
- JAVA 1.6 update 1

•LinuxPC3 – Stand alone, non-baseline AWIPS PC

- Processors: Intel Dual Core, 2GHz CPU with 2Mb cache
- Memory:2 Gigabyte RAM
- Video Card: NVIDA GeForce Go7400, 256 MB Video RAM
- CentOS Linux 4.4
- JAVA 1.6 update 1

6 Test Bed 6

The following hardware / software items are configured as the test computer at NWS HQ:

• Windows

- Computer: Dell Precision 380
- Processors: Dual Pentium D 2.4GHz
- Memory: 1.5 Gigabyte RAM
- Hard Drive: 100 Gigabyte IDE Hard Drives
- Video Card: NVIDIA Quadro FX with 256 MB Video RAM
- Monitor: 19” LCD Monitors
- Microsoft Windows XP, service pack 2
- JAVA 1.6 update 1